

Introducing the BlackRock Sovereign Risk Index

A More Comprehensive View
of Credit Quality

BlackRock Investment Institute

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Executive Summary

- ▶ Investors are waking up to the significance of sovereign credit risk in global debt markets, but quantifying the appropriate premium remains difficult.
- ▶ In response, we are introducing a transparent and disciplined approach to assessing credit risk for sovereign debt issuers. The BlackRock Sovereign Risk Index numerically ranks issuing countries using a comprehensive list of relevant fiscal, financial and institutional metrics.
- ▶ The results contain several interesting insights for debt investors, and some very distinct groupings of countries emerge. The top countries are fiscally responsible and institutionally robust Northern European states, and the bottom ones include the European periphery as well as some emerging markets.
- ▶ Our index can be modified to create screened products that could potentially address some of the problems associated with market-cap- or GDP-weighted indices.

Over the past few years, global capital markets have become attuned to the idea that sovereign debt is not “risk free”. While in reality sovereigns never were devoid of credit risk, the probability of capital erosion through default, inflation or devaluation has certainly increased since the Great Recession began. Far from being a problem particular to emerging markets, the developed world is actually at the center of the debate on debt sustainability. Along with traditional interest rate and liquidity premia, compensation for credit risk is now being built more explicitly into the yields of all countries, irrespective of their historical default experience or share of global production.

For investors who try to earn a modest premium above inflation by investing in global sovereign debt markets, a credit event can be catastrophic. Quantifying the appropriate compensation for this risk has not been an easy task, given the lack of recent historical experience. The nature of market-value weighted indices, which overweight large issuers of liabilities, has also impeded price discovery in traded debt markets.

Some market participants have gravitated toward simple measures of credit quality, such as the government debt/gross domestic product ratio, to guide their investment decisions. However, these measures only tell part of the story—there are other factors, such as reserve-currency status or trend growth rates, which are equally important in assessing the vulnerability of debt to a credit event.

Recognizing the importance of this source of volatility for investors, BlackRock has developed an index that ranks sovereign debt issuers according to the relative likelihood of default, devaluation or above-trend inflation. The index attempts to intelligently summarize and combine the most important factors that go into the analysis of debt sustainability, using a transparent and disciplined approach.

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The BlackRock Sovereign Risk Index goes beyond the standard “debt/GDP” metric, drawing on a body of research and pool of data that incorporates a much more comprehensive view of the factors affecting credit quality. In this paper, we discuss the index framework and outline the factors that we have selected. We also examine the results of the exercise, and suggest applications of the index for our clients.

Assessing the Risks: Which Factors Matter?

Global debt markets have been vividly reminded recently of how rapidly a nation’s access to the capital markets can change, and how violently a country can transition from risk-free to risky status, as the ownership base switches from newly unwilling holders to opportunistic buyers. Because this transition can occur so quickly, an awareness of the factors that might cause a sovereign to approach a tipping point is critical for understanding the risks inherent in sovereign debt.

One popular and readily accessible indicator used to assess a country’s likelihood of paying back its outstanding obligations in full and on time is the debt-to-GDP ratio. The debt-to-GDP figure conveniently frames the outstanding debt burden of a government in relation to the annual income generated by the country. The logic supporting this indicator is straightforward: A higher debt burden implies high costs of servicing that debt, suggesting that a large share of income over a long period of time may need to be devoted to paying down that debt.

There are, however, many other factors that can influence a country’s likelihood of paying its real obligations in a timely fashion. For example, the term structure and maturity profile of debt may be far more important than its aggregate size. If a government has sufficient time to decide how to restructure its debt or establish measures to cut costs, it is significantly less likely to be forced into making a difficult decision. The world’s largest developed nations may actually enjoy the relative luxury of retooling the productive capacities of their economies while holding relatively high debt-to-GDP ratios. The United Kingdom, for example, possesses the ability to engage in recovery and austerity efforts at least in part because it has a long debt term structure. In contrast, one need only consider how quickly the Greek debt crisis spiraled out of control to see what can happen when a country does not have that luxury.

The usefulness of an index lies in its ability to pull together a wide variety of relevant factors in a systematic, transparent way. There are, of course, a multitude of potentially relevant features used by an investor to differentiate among credits. An index gathers all the data in one place and assigns relative weights to relevant factors, creating a unified framework for the assessment of credit risk. It creates consistency and allows users to focus on other potential issues that are not included in the index—such as news flow or political developments—when charting an investment strategy.

Constructing the Index

The first step in constructing the BlackRock Sovereign Risk Index is to identify and categorize relevant fundamental drivers of credit quality. These factor inputs are at the heart of the exercise. The drivers used in the index were selected based on academic research, sensibility and pertinence. Many of the metrics included are quantitative, and those dealing with qualitative aspects are expressed numerically.

“The high correlation between the BlackRock Sovereign Risk Index and CDS spreads suggests that we have identified significant drivers of sovereign risk, even while avoiding direct inclusion of market-based measures in the index.”

In order to guide this exercise, we created four broad conceptual categories into which we attempted to place all key factors. The categories are designed to address several of the most critical questions with respect to debt sustainability:

- ▶ **Fiscal Space**—This category assesses if the fiscal dynamics of a particular country are on a sustainable path. It estimates how close a country is to breaking through a level of debt that will cause it to default (i.e., the concept of proximity to distress), and how large of an adjustment is necessary in order to achieve an appropriate debt/GDP level in the future (i.e., the concept of distance from stability).
- ▶ **External Finance Position**—The factors in this category measure how leveraged a country might be to macroeconomic trade and policy shocks outside of its control.
- ▶ **Financial Sector Health**—This category considers the degree to which the financial sector of a country poses a threat to its creditworthiness, were the sector were to be nationalized, and estimates the likelihood that the financial sector may require nationalization.
- ▶ **Willingness to Pay**—In this category we group factors which gauge if a country displays qualitative cultural and institutional traits that suggest both ability and willingness to pay off real debts.

The set of factors we include in the model are listed in *Table 1*, where we place each driver into a category and provide a short description of its assessed importance in evaluating sovereign credit risk.

The factors highlighted in *Table 1* are certainly not uncontroversial, and raise tough questions: the relative merits of net debt and gross debt, and the treatment of off-balance-sheet liabilities; the selection and reliability of data sources; and the balance between comprehensiveness and simplicity. These issues are generally addressed using our intuition (i.e. the importance we assign to specific factors), and, as we discuss later, we ran market calibrations to test the sensibility of the results.

For each factor, we ranked all of the countries based on a simple “z-score” methodology using the average and standard deviation of the factor sample. We then weighted the different ranked factors according to the scheme presented in *Figure 1*, and added up the results for each country. Finally, we sorted the results to show cross-sectional rankings in order of strongest to weakest credit quality. We found it useful to combine the fiscal space factors into two structural measures, “Distance from Stability” and “Proximity to Distress,” that summarize the relationship between several important debt sustainability factors. Their construction can be found in the Appendix.

As discussed earlier, we categorized all factors into one of four buckets: Fiscal Space, External Finance Position, Financial Sector Health and Willingness to Pay. *Table 1* illustrates the categories and shows the weights we assigned to them.

There are certainly a number of challenges that arise in conducting this exercise. For example, how should we best set weights on factors without a reliable historical guide to their importance? While we considered using historical data, we ultimately chose to set weights for all the factors using our priors. One difficulty in setting empirical factor weights is, of course, that the default/inflation/devaluation experience for developed market countries is extremely limited, and we recognized that neither BlackRock nor the market believes it is reflective of the risks going forward. In addition, the quality of emerging market data becomes more questionable running back into the early 1990s and 1980s.

Table 1: Key Drivers of Credit Quality

Fiscal Space	
Debt/GDP	This basic measure of fiscal capacity is one of the core drivers of the ability to pay. Assuming a roughly constant tax share, the growth rate of the real income of a country is an important factor in determining the relative difficulty of paying or defaulting (through restructuring, repudiation, dramatic devaluation or above-trend inflation). We use net debt, and estimate the figure from a variety of sources.
Per Capita GDP	Higher absolute levels of per capita income are generally associated with higher levels of sustainable debt, as the economic and institutional context for borrowing improves further up the income scale. Richer countries tend to have better gearing ratios between capital and labor than poorer countries, leading to more stable economies with better income-generating capacity. We benchmark per capita GDP in purchasing power parity terms as a percentage of the US income level.
Proportion of Domestically-Held Debt	Who owns the debt can be a crucial consideration because it can skew incentives to pay. As an extreme example, if 95% of a country's debt is owed to foreigners, the state may be incentivized to default because its constituency isn't directly hurt if it does so.
Term Structure of Debt	If a government has sufficient time to decide how to restructure its debt, retool its economy or establish measures to cut costs, it is significantly less likely to be forced into making a difficult decision. A positive debt maturity structure helps lower the likelihood that a liquidity crisis becomes a solvency crisis. We analyze this likelihood by looking at total debt maturing within two years as a proportion of GDP.
Demographic Profile	Since debts are nominal, higher nominal income makes paying off those debts relatively easier. A growing population also means relatively more ease in creating nominal income. Higher population growth rates are also associated with higher levels of capital productivity. We use the age dependency ratio (the number of non-workers such as children and retirees in a country as a proportion of that country's working age population, aged 15-64) in the year 2030 as a measure of the working-age population dynamic of a nation over time.
Growth and Inflation Volatility	All things being equal, an unstable income stream for a government should mean a higher likelihood of defaulting. Stable growth histories with low volatility of inflation suggest that a country will have the ability, year-in and year-out, to service its loan payments and gradually move towards a sustainable debt level. This is the public-sector equivalent of a bank lending to a customer with steady job income.
Debt/Revenue	A country's tax take is also important—we argue that for a given level of debt, more tax income is better. At same time, we don't use this metric exclusively, as taxes that are too high might mean less flexibility for the economy and a reduced ability to raise taxes going forward.
Depth of Funding Capacity	As with a favorable debt maturity schedule, easy access to funding markets helps ensure that liquidity crises are less likely. We use the "Access to Capital Markets" component of the Euromoney Country Risk ranking.
Default History	Given regime changes and the evolution of institutional depth and quality, it is exceedingly difficult to use the past as a predictor of future actions on the part of a sovereign. However, there is some evidence that past defaulters are more likely to default again when compared to countries with clean payment histories. ¹ We proxy the historical proclivity towards default using the incidence of lending arrangements with the International Monetary Fund since 1984.
Reserve Currency Status	Certain countries, by virtue of their status in world trade, their historical growth performance and the depth of their financial markets, are the natural recipients of capital flows from countries looking to increase their reserves of foreign currency. These countries also tend to act as safe havens when markets experience volatility. This "exorbitant privilege" allows them to more easily finance deficits and debt loads without incurring the discipline of the markets. We endow the US, Japan and the eurozone with varying degrees of this status.
Interest Rate on Debt	The interest rate on debt is a crucial input when calculating the level of government debt at some point in the future. If the growth rate of debt is greater than the growth rate of income (GDP) over a prolonged period of time, a country will need to adjust its spending patterns (primary balance) to achieve stability in debt/GDP at some point in the future.
External Finance Position	
External Debt/GDP (Net of Foreign Exchange Reserves)	The currency in which debt is owed can be important for a sovereign, as it may limit options for repayment. If debts are denominated in local currency, a government may have the option to reduce those debts by "printing" money in moderate amounts. This option is unavailable when the debt is owed in the currency of other countries, which means it must be paid out of foreign exchange reserves or current income at spot exchange rates. To the extent that reserves are unavailable and a currency has weakened, a liquidity crisis may ensue. As mentioned in other factor descriptions, liquidity crises have the ability to hasten solvency crises. We also incorporate the term structure of external debt in this analysis, as well as the size of a banking sector's external liabilities, in proportion to the sector's frailty. There are instances of quasi-external debt, where debt may be denominated in local currency but the "option to print" assumption doesn't hold—eurozone members fit such a profile, where the ECB's activities remain distinct from the wishes of any individual member state. In such cases, we have designated a proportion of domestically-denominated debt as external, trending inversely with the influence the country at hand can be expected to have on the central bank.
Current Account Position	In very general terms, to the extent that a country is a net importer of goods, it will also be a net issuer of liabilities. The bigger the import ratio of a country, the more vendor financing it is likely to require, and therefore the more prone it might be to building up a large debt load. It is also likely that the country will find it more difficult to use import substitution to increase the competitiveness of its economy. We consider the current account position as a proportion of GDP, as well as of exports.

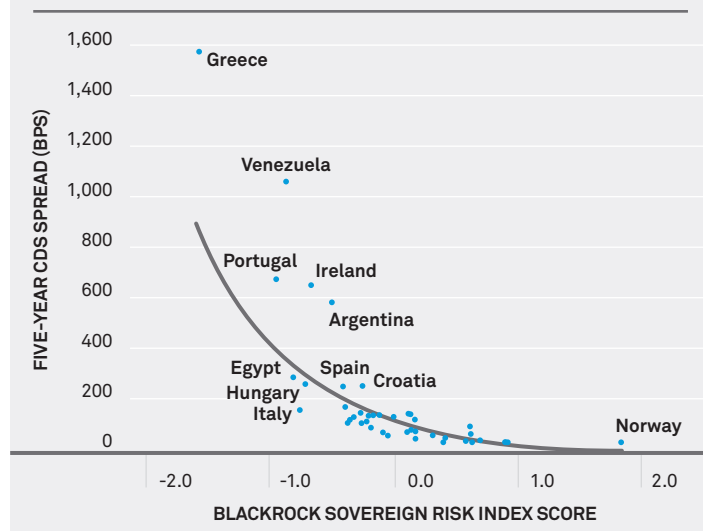
¹ "The Costs of Sovereign Default," Eduardo Borensztein and Ugo Panizza, IMF Staff Papers, Vol. 56, No. 4, pp. 683-741, 2009.

Table 1: Key Drivers of Credit Quality (Continued)

Financial Sector Health	
Bank Credit Quality and Size	A weaker banking sector means a higher probability that the liabilities of the sector will be assumed by the sovereign. This risk transfer from private to public balance sheets can significantly increase the debt burden of a government, especially if the size of the banking sector is large. We use a variety of third-party bank health measures, a composite capital adequacy ratio and a non-performing loan ratio to characterize a country's banking system in terms of quality.
Credit Bubble Risk	Countries with rapid growth in private debt loads have been shown to be more prone to enter asset price bubbles. Even if a government's formal liabilities are not large, it may be politically incentivized to step in and bail out an over-stretched domestic private sector. Countries that experience credit bubbles are also more likely to have weaker bank credit quality.
Willingness to Pay	
Political/Institutional Factors	These factors are designed to capture the “soft,” qualitative aspects of a country's ability to adequately service its obligations. The factors intend to capture the willingness—as opposed to the ability—of a country to pay, the flexibility of an economy and its capacity for growth, the transparency of data, as well as a country's fiscal credibility and commitment to responsible borrowing. These factors are collated from a variety of public and private sources and include measures of government effectiveness, legal rights and process, payment delays, repatriation risk, corruption, democratic accountability, government cohesion, government stability and support, and bureaucratic quality. ¹

We therefore opted to set the factors according to our priors on relevance and quality of data, and take comfort in their sensibility by validating the index constituents against their respective spreads in the sovereign CDS market (see Figure 2). The high correlation (-0.86) between the index and CDS spreads suggests that we have identified significant drivers of sovereign risk, even while avoiding direct inclusion of market-based measures in the index.

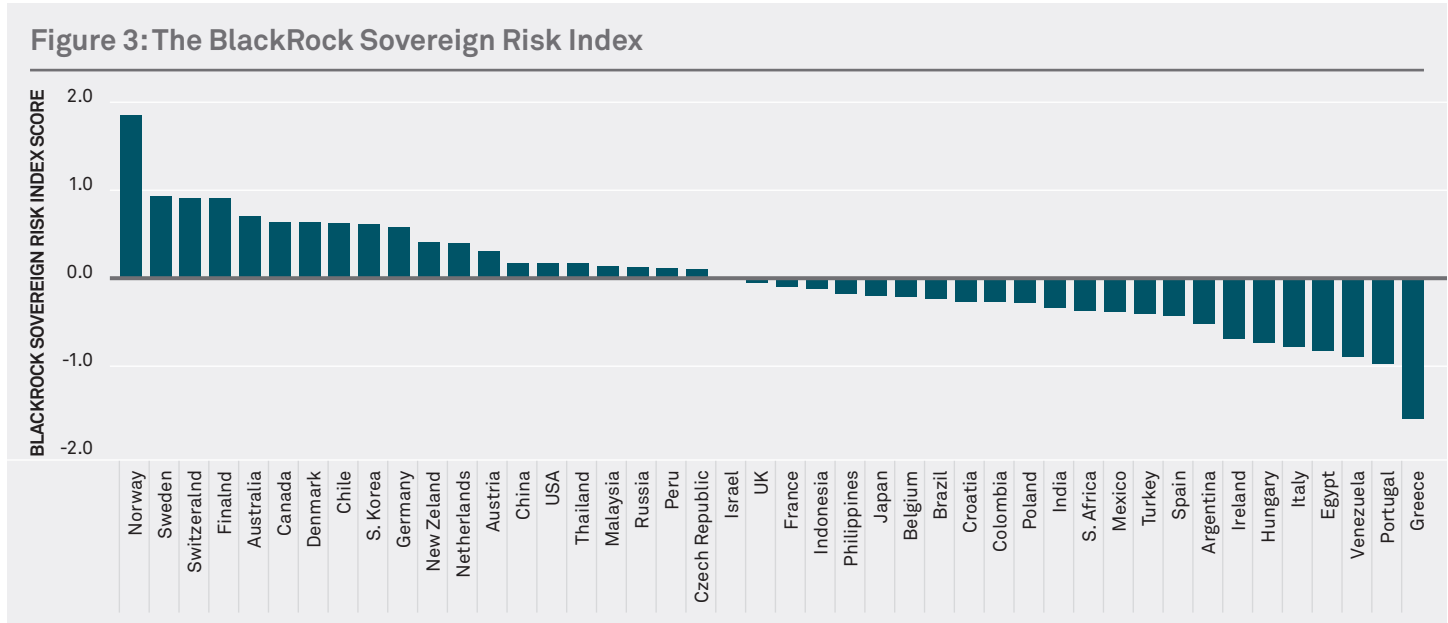
Another difficulty is the fact that the ranking is across countries rather than absolute. This means that the index attempts to estimate relative risks, rather than explicit probabilities of default and severities of loss. The goal of providing reasonable grounds of comparison across the 44 countries was also a constraint—additional idiosyncratic insight can be determined in particular countries where there is a greater wealth of data. A list of sources is included in the appendix.

Figure 1: Categories and Weights Behind the Index**Figure 2: Index Scores Exhibit a High Correlation to CDS Spreads**

Sources: Bloomberg, BlackRock.

Results

In the inaugural version of the BlackRock Sovereign Risk Index, published in June 2011, we included 44 countries. The results are presented in Figure 3 below, with stronger countries on the left-hand side of the chart and weaker ones toward the right.



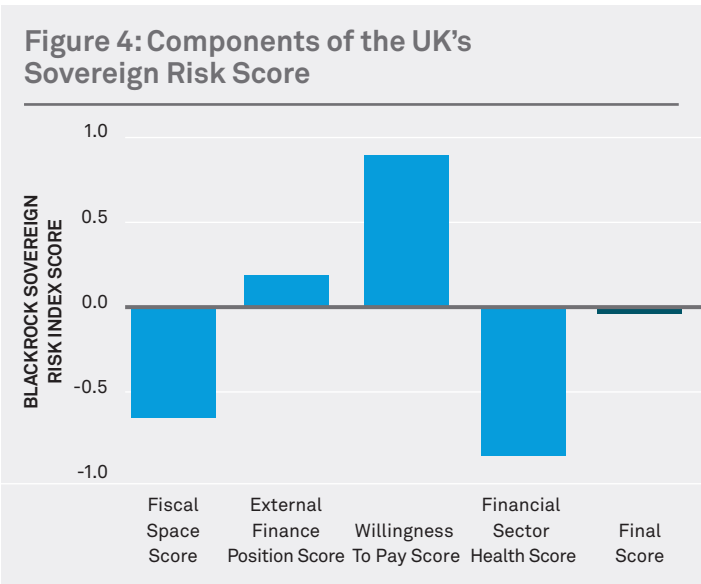
Sources: IMF, Eurostat, Bloomberg, World Bank, United Nations, BIS, Central Bank Websites, Consensus Economics, EIU, Euromoney, PRS Group, Moody's, Standard and Poor's, Fitch.

Topping the index is Norway, which benefits from extremely low absolute levels of debt, a strong institutional context and very limited risks from external and financial shocks. A natural corollary to the country's low debt level is a relatively small amount of bonds available for purchase in the debt markets. At the bottom of the rankings lie Greece and Portugal, whose debt levels appear to be unsustainable at current levels of growth and expenditure behavior. Along with those two countries, the index also highlights Ireland, Hungary, Italy, Egypt and Venezuela as significantly below-average credits. Of course, as the data evolves, and as we add new countries, the rankings will change.

The two most topical countries this year, Ireland and Greece, both score poorly in the index—no great surprise, certainly. However, they do so for different reasons—Greece's debt sustainability problems are a result of the fiscal dynamics of the government, whereas Ireland's problems are primarily related to the size and quality of its banking sector.

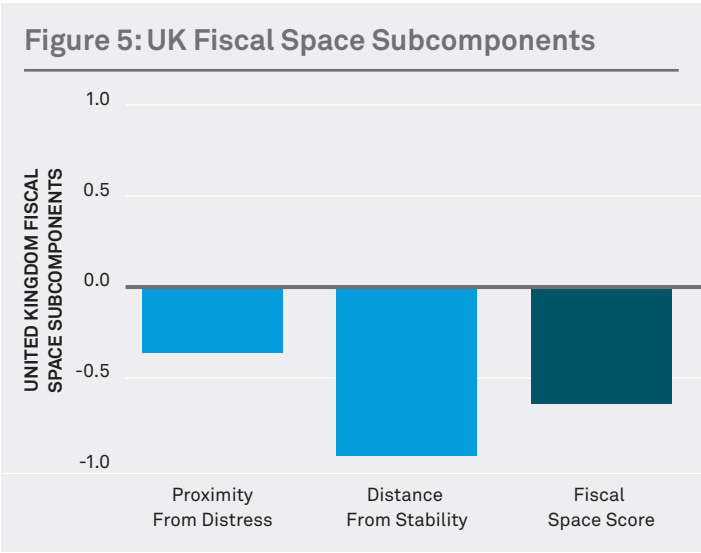
Therein lies one of the most valuable features of this index: the ability to explore in detail the drivers of a specific country's rankings. For example, the UK is marginally weak in comparison with the other countries in the index. While the country's institutional strength and integrity is notable, and it is insulated from external financial shocks, its weakness is attributable to a weak fiscal space profile, while contingent liabilities to the financial sector also drag (See *Figure 4*).

¹ We have not yet found a suitable quantitative measure of "financial repression", a concept we explored in a previous publication ("Sovereign Bonds: Reassessing the Risk-Free Rate" BlackRock Investment Institute, April 2011). If a country has a large amount of accumulated savings, those savings can be used (perhaps involuntarily) to fund large government deficits, thus prolonging the sustainability of a given debt load.

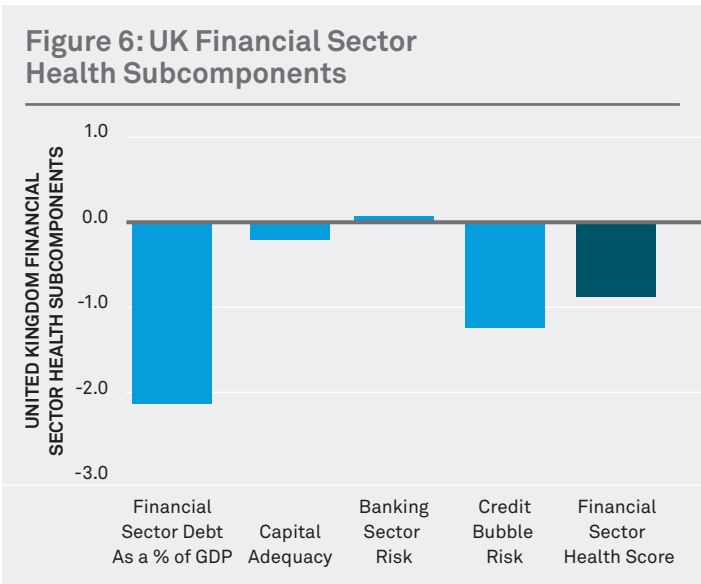


Sources: IMF, Eurostat, Bloomberg, World Bank, United Nations, BIS, Central Bank Websites, Consensus Economics, EIU, Euromoney, PRS Group, Moody's, Standard and Poor's, Fitch.

Drilling down into the UK's low scores shows that the continuing high primary structural deficit is core to the country's poor fiscal space profile. Proximity to distress also drags, but to a lesser degree. Within the Financial Sector Health Score, the principal risk is the size of the potential contingent liability the banking sector poses relative to the state. In addition, the UK's growth of credit has outpaced GDP in recent years, a hallmark of a bubble (*Figures 5 & 6*):

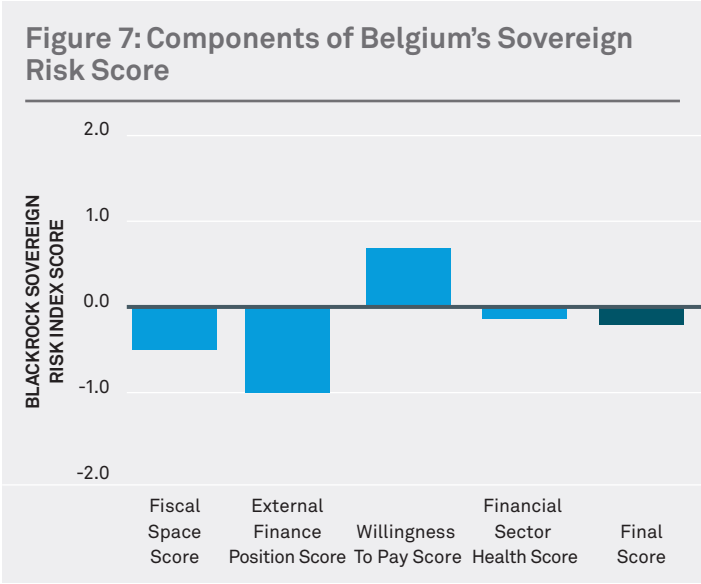


Sources: IMF, Eurostat, Bloomberg, World Bank, United Nations, Central Bank Websites, Consensus Economics, EIU, Euromoney, Moody's, Standard and Poor's, Fitch.



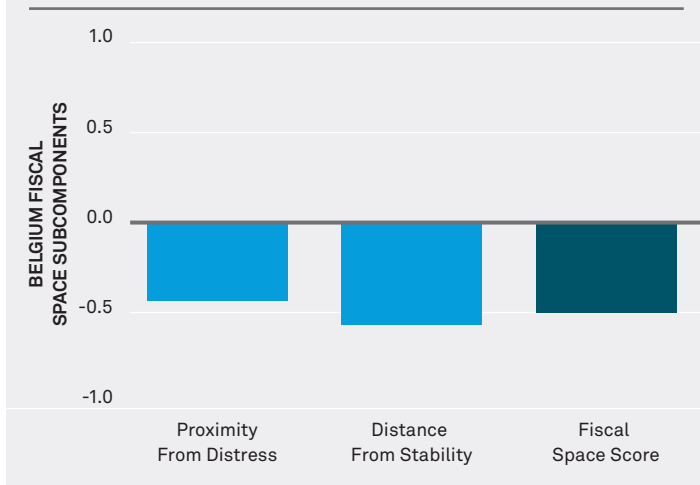
Sources: Bloomberg, World Bank, Moody's, Standard and Poor's, Fitch.

Belgium presents another interesting profile, ranking further down our index than its agency rating ranking (AA+) might suggest. Unlike the UK, there is no contingent overhang of liabilities from the finance sector, but the other factors are significant drivers for sovereign risk.



Sources: IMF, Eurostat, Bloomberg, World Bank, United Nations, BIS, Central Bank Websites, Consensus Economics, EIU, Euromoney, PRS Group, Moody's, Standard and Poor's, Fitch.

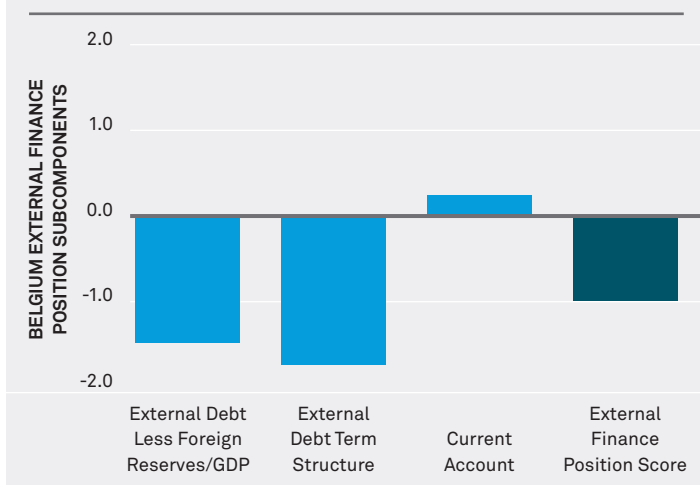
Looking to the subcomponents of fiscal space, Belgium's proximity to distress is a dragging factor, accentuated by high rollover requirements in the near term (38% of GDP over the next two years) and a low domestic investor base (41% of government debt is held domestically). The distance from stability factor

Figure 8: Belgium Fiscal Space Subcomponents

Sources: IMF, Eurostat, Bloomberg, World Bank, United Nations, Central Bank Websites, Consensus Economics, EIU, Euromoney, Moody's, Standard and Poor's, Fitch.

fares no better; under these assumptions, the primary deficit would have to correct 3.4% on average every year for current net debt levels to return to 60% over the next 10 years.

The external finance position has the biggest negative effect on Belgium's score, however. As a small country within the eurozone, Belgium has a substantial quasi-external debt exposure, with a high rollover burden over the next two years. Given the euro denomination of this debt, it has not amassed significant foreign reserves, which leaves it with few options should a liquidity crisis arise.

Figure 9: Belgium External Finance Position Subcomponents

Sources: Bloomberg, BIS, Moody's, Fitch, Consensus Economics, PRS Group.

At present, these negative factors are compensated by a high willingness to pay score, but confidence in the country's institutional integrity may yet be eroded by continuing problems in government—Belgium has been without an official government since its last elections on June 13, 2010.

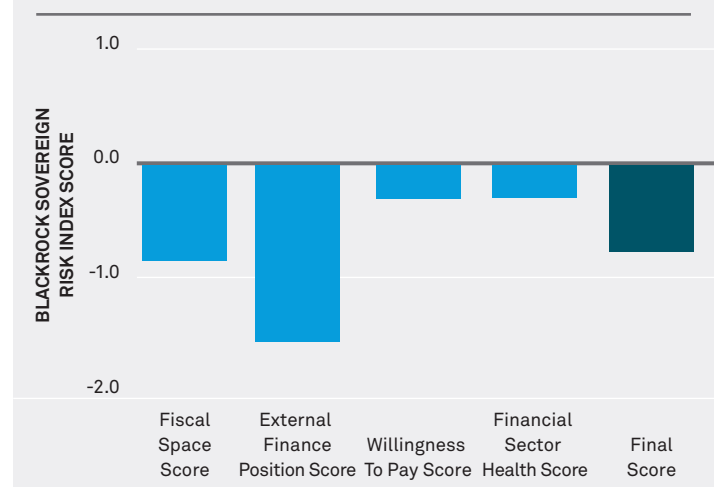
Another interesting case framed by this approach is Italy. At 101% of GDP, its net debt is extremely high for a country with its fundamentals and term structure (it needs to roll approximately 43% of its GDP in debt over the next two years), so its proximity to distress is far from grounds for comfort.

Although Italy is expected to run a primary budget surplus this year, the interest it pays on its existing debt, against a backdrop of anaemic long-term growth projections and an aging demography, significantly impedes a path to stability.

Turning to vulnerability to external finance shocks, Italy runs a persistent current account deficit, and its position within the eurozone means it does suffer from quasi-external debt exposure and cannot “print” itself out of difficulties if they arise.

Other factors drag—though to a lesser degree—on Italy's sovereign risk: institutional integrity metrics are weak relative to its peers, and the capital adequacy of its banking sector also compares badly (though the financial sector does not present a large-scale contingent liability for the economy as a whole).

Taking these points into consideration, we believe that Italy may be a case where markets are too sanguine about sovereign risks, and would be inclined to be defensive on this market within an index.

Figure 10: Components of Italy's Sovereign Risk Score

Sources: IMF, Eurostat, Bloomberg, World Bank, United Nations, BIS, Central Bank Websites, Consensus Economics, EIU, Euromoney, PRS Group, Moody's, Standard and Poor's, Fitch.

“As a more intelligent way of gaining exposure than traditional indices, or as a low-cost means of buying insurance against drawdowns, an approach like the one we detail may be useful.”

Applications

We believe that the BlackRock Sovereign Risk Index can be used to meet a variety of needs and act as an efficient aid to risk-adjusted security selection. For investors looking to maintain exposure to global debt markets, but also wishing to improve the tail-risk characteristics of market- or GDP weighted indices, the index can help screen specific exposures. Alternatively, the index can also be used to guide strategic tilts into or out of all names in an existing index.

Another interesting application could be to use the index as the basis for an investable benchmark. This exercise would require an adequate liquidity screen to ensure there is appropriate float in the issuers of sovereign debt, in order to make the index realistically investable.

Using the index as a predictive tool for outperformance year-in and year-out may prove difficult, and using a fundamental model to predict technical or political developments can be tricky. But as a more intelligent way of gaining exposure than traditional indices, or as a low-cost means of buying insurance against drawdowns, an approach like the one we detail may be useful. What is clear to us is that investors can certainly benefit from a more sophisticated approach to the sovereign debt markets. The BlackRock Sovereign Risk Index has been devised to help investors identify and manage risk in a consistent and disciplined fashion. We believe that this index highlights BlackRock’s commitment to helping ensure a better financial future for our clients.

Appendix

Our Fiscal Space category contains two different, equally-weighted measures designed to summarize a series of factors. The measures are: “Distance from Stability” and “Proximity to Distress.”

Distance from stability asks the question: Given forecasted growth and interest rates, how much adjustment is necessary in primary balances to achieve a stabilized debt/income at or below a sustainable debt level? It represents the structural adjustment in spending and tax patterns needed from this point on to achieve a stable and appropriate debt/GDP level in 10 years. The stylized formulation of this measure is shown in *Box 1*.

Box 1: Distance from Stability

Fiscal Distance = Annual Primary Balance_t – Annual Paydown Requirement

Where

$$\text{Annual Paydown Requirement} = \frac{(\text{Target Debt/GDP}_{t+10} - \text{Debt/GDP}_{t+10})}{10}$$

Target Debt/GDP_{t+10} = 60% for High-Income Countries
30% for Low-Income Countries

$$\text{Debt/GDP}_{t+10} = \frac{((g - r) * \text{Debt}_t) * 10}{(\text{GDP}_t * g) * 10}$$

and

g = Forecasted Growth Rate

r = Forecasted Interest Rate

Proximity to distress is a slightly different approach to stability using several additional factors. It asks the question: At the current “burn rate” of budget deficits, how long does a country have before it reaches a breaking point beyond which it will be very unlikely to recover without defaulting? The stylized formulation of this measure is shown in *Box 2*:

Box 2: Proximity to Distress

Proximity to Distress, Years = Fiscal Space / Latest Budget Deficit as % of GDP

Where

Fiscal Space = Maximum Debt/GDP – Current Debt/GDP

Maximum Debt/GDP = $f(\text{GDP Per Capita}) * f(\text{Demographic Profile, Term Structure of Debt, Domestic Ownership Structure, Debt/Tax Revenue, Growth/Inflation Volatility, Access to Funding, Previous Defaults, Reserve Currency Status})$

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